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ABSTRACT

Literacy is examined from the viewpoint of systemic linguistics. It is proposed that "literacy" means intervening in the social processes by working with written language, and this can not be accomplished by an individual alone. "Using written language" can not be isolated from "using language." While sociologically, it may make sense to treat literacy as a thing in itself, linguistically, it does not. Writing may have its own grammar, discourse semantics, and genres, but everyone who writes, speaks; and the primary context of writing is speaking. All ideologies in literate cultures are the product of both; not the sum of the two, but the dialectic between them. At this level, it makes little sense to treat literacy and oracy separately; the concept needed is that of "articulacy," or making meaning by using text in context. (MSE) (Adjunct ERIC Clearinghouse on Literacy Education)

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LINGUISTIC PERSPECTIVES ON LITERACY: A SYSTEMIC-FUNCTIONAL APPROACH

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LINGUISTIC PERSPECTIVES ON LITERACY: A SYSTEMIC-FUNCTIONAL APPROACH

M.A.K. Halliday

Literacy in social processes

When Frances Christie agreed to convene the Inaugural Australian Systemics Conference, she chose as its topic "Literacy in Social Processes". I found this challenging, in more than one way. Fran was reminding us that, although literacy has been a frontline issue for the past twenty-five years, both within and outside the debates in language education, we have never explicitly foregrounded it as a concern of systemic linguistics. But also, in using (I take it, deliberately) a wording that is multivalent, she was forcing us to reflect on what it means. Are we to take literacy in its more recent sense, of 'the use of language in its written form', where literate is contrasted with oral (or orate)? or in its more traditional sense of 'the ability to read and write', where literate is contrasted with illiterate? If the former, then a natural reading would be 'the use, or place, of written language in social processes', although 'using written language, considered as one social process among others' is also possible. If the latter, then perhaps we would understand it as 'mastering written language in the course of, or for the purpose of, taking part in social processes'. In taking up the challenge of looking at literacy from a systemic point of view, I shall try to think of it in all these senses at once.[1]

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[1] Graff writes that "literacy is above all a technology or set of techniques for communications and for decoding and reproducing written or printed materials: it cannot be taken as anything more or less"; compare this with "the skills of literacy: the basic abilities to read and write" [his italics]. See Harvey J. Graff, The Labyrinths of Literacy: reflections on literacy past and present, London: Falmer Press, 1987, pp. 18, 19.

For me the opportunity comes timely, because it is just twenty years since we launched Breakthrough to Literacy from the Programme in Linguistics and English Teaching at University College London.[2] That too had a title that was problematic, although it turned out to be so in a way that David Mackay (who was in charge of the Breakthrough project and gave it its name) had not in fact anticipated. People assumed that we were boasting: here at last was a programme that broke through, that for the first time enabled children to succeed in becoming literate. What we actually had in mind was that becoming literate was itself a breakthrough; the only ambivalence we

had recognized was the obvious one, in the grammar, whereby breakthrough could be read either as a process (a verb, perhaps in imperative) or, by grammatical metaphor, as its result (as in you've made a breakthrough).

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[2] David Mackay, Brian Thompson & Pamela Schaub, Breakthrough to Literacy, London: Longman (for the Schools Council), 1970. See especially the revised and illustrated edition of the Teacher's Manual, same author and publisher, 1978. For an account of the Programme, see John Pearce, Geoffrey Thornton & David Mackay, 'The Programme in Linguistics and English Teaching, University College London, 1964-1971' in Ruqaiya Hasan & J.R. Martin (eds.), Language Development: learning language, learning culture, Norwood, N.J.: Ablex (Advances in Discourse Processes XXVII), 1989, 329-268.

No doubt by using the word literacy, instead of reading and writing, we were signalling that this was a breakthrough to a higher semiotic state; together perhaps with the further message that, in becoming literate, you take on board the more learned forms of language that are used in writing -- and the system of social values that goes with them. Then the syntagmatic tension between the Anglo-Saxon breakthrough and the Latin literacy, representing the impacting of the material and the discursive (in the wording of today), helps to locate literacy at the level of the social semiotic -- and we are back once again at the title of the conference.

In the generation or so since Breakthrough first appeared, literacy has come to mean many different things -- even more than it did at the time. In particular the word is now contextualized within various more or less disciplinary discourses, psychological, sociological, historical, political, economic and so on; sometimes contrasted with a traditional, 'purely linguistic' conception. It could be argued, however, that literacy has very seldom been investigated as a linguistic phenomenon -- that is, interpreted in language-theoretical terms, as a linguistic process contextualized on many levels, in ways which bring out something of the complex dialectic within and between them. To cite one piece of evidence for this, it is my impression that in university linguistics courses, if literacy is dealt with at all the level of conscious understanding at which it is discussed is well below the level of unconscious understanding which must have been reached for language to be written down in the first place, some 200 generations ago. And while the 'literacy debate' has moved on to higher, more rarefied levels, it tends to be forgotten that reading and writing, and learning to read and write, are activities constructed in language. Yet acts of meaning cannot be adequately explained without reference to the material events by which they are constituted.

In many instances the term literacy has come to be dissociated from

reading and writing, and written language, altogether, and generalized so as to cover all forms of discourse, spoken as well as written. In this way it comes to refer to effective participation of any kind in social processes.[3]

[3] The following is taken from Australia Post's description of International Literacy Year 1990: "Literacy involves the integration of listening, speaking, reading, writing and critical thinking; it incorporates numeracy. Literacy also includes the cultural knowledge which enables a speaker, writer or reader to recognise and use language appropriate to different social situations" (Australian Stamp Bulletin no. 203, January - March 1990, p. 10).

Having argued for much of my working life that we still do not properly value spoken language, or even properly describe it, I naturally sympathize with those who use the term in this way, to the extent that they are by implication raising the status of speaking, of the spoken language, and of the discourse of so-called "oral cultures". The problem is, that if we call all these things literacy then we shall have to find another term for what we called literacy before; because it is still necessary to distinguish reading and writing practices from listening and speaking practices. Neither is superior to the other, but they are different; and, more importantly, the interaction between them is one of the friction points at which new meanings are created.[4] So here

[4] The situation is similar to that which arises with the term language. If we want to extend it to mathematics, music and other semiotic systems, in order to emphasize their similarities of form or function or value in the culture, then we have to find another term for language. The expression "natural language" arose in response to just this kind of pressure. I am not aware of any comparable term for literacy in its canonical sense.

I shall use literacy throughout to refer specifically to writing as distinct from speech: to reading and writing practices, and to the forms of language, and ways of meaning, that are typically associated with them.

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The written medium

At this first level, then, literacy means writing language down; and to be literate means to write it and to read it. We tend to use expressions like "to know how to" read and write; but I think it is more helpful to conceive of it as activity rather than as knowledge.[5]

[5] Graff (ibid., p. 23) quotes the following from M.M. Lewis' The Importance of Illiteracy (London: Harrap, 1953, p. 16): "The only literacy that matters is the literacy that is in use. Potential literacy is empty, a void."

When you write, your body engages with the material environment. You make marks in sand, or arrange wooden shapes, or move a pointed stick across a surface so that it leaves a mark. (As a small child, I had a magnificent set of large wooden letters; but since they were letters, I posted them. After that I made letter shapes out of any suitably inert sinuous material, like wet string, or my father's watch chain.) Or, if you use Breakthrough to Literacy, you arrange printed cards on a stand; in this way you can be engaging with the written symbols without being required first to master the material processes of constructing them.

The nature of the material environment, and the way our bodies were able to create patterns in it, opened up the possibility of writing, and also circumscribed the forms which writing took.[6] (I will come back in the

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[6] This notion of "meaning making practices" being "enabled and constrained" by the material (or other) conditions in which they are taking place is explained and exploited by Paul Thibault in his forthcoming book Social Semiotics as Praxis: text, social meaning making and Nabokov's "Ada" (Minneapolis: University of Minnesota Press).

next section to the question of how this actually came to happen.) In the process, a whole variety of new **things** came into being. The patterns of writing create systemic properties which are then named as abstract objects, like the **beginning** and **end** of a page or a line, **spaces** between **words**, and **letters**, **capital** (or **big**) and **small**. The different kinds of letter have their own names: they are called **ey**, **bee**, **sea** and so on; and there are other symbols called **comma**, **question mark**, **full stop** (or **period**). Children learn that **writing** is different from **drawing**; and that whereas 'what I have drawn' is named with reference to my world of experience, such as a cat or a house, 'what I have written' is of a different order of reality: either it has its own name, as an object created in the act of writing ('you've written a **"c"**'), or it is named with reference to another symbol -- to an element of the language, usually a phoneme or a word ('you've written **/k/**', 'you've written **cat**'). This last is of course very complex, since it is a symbol standing for a symbol.

Names, however, do not occur as lexical items in isolation; they function as elements in lexicogrammatical formations, like What shall I do? -- Go and read your book. These clause, phrase and group structures construe the relationships among writer, reader and text, with wordings such as

The capital letter goes at the beginning of the sentence.

You must put two ells in silly.

I've written a letter [where letter is ambiguous; contrast I've written you a letter, where it is not]

Hippopotamus -- that's a very long word.

You say it, and I'll write it down.

If we analyse expressions like these grammatically, in terms of the processes and participant roles in the clauses, and the experiential structures of the nominal groups and prepositional phrases, we gain interesting insights into the nature of writing, at this level of the written medium.

At this level, then, to talk about literacy in social processes means that these are being enacted, at least in part, by language in the written medium; and being literate means engaging with language in its written form: distinguishing what is writing from what is not writing, and producing and recognizing graphic patterns. These patterns include the symbols themselves, and their arrangements relative to each other and to the frame. They also take into account the many variants of these forms and arrangements, such as type face, printing style, and layout; including, today, all the innovations coming in the wake of the new technology -- but those will take us up to another level. Meanwhile the next link in our chain of linguistic interpretation will be to consider the nature of writing systems.

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Writing systems

It would be wrong to suggest that, historically, writing began as language written down: that writing simply grew out of speaking when certain people began devising a new means of expression. That is not likely to be how it happened. People came to write not by constructing a new medium of expression for language, but by mapping on to language another semiotic they already had. Writing arose out of the impact between talking and drawing (that is, forms of visual representation).

If you create a certain outline, and say it represents a horse (the object), you have 'drawn a horse'. If you say it represents horse (the word), you have 'written horse'. It may be exactly the same outline, in both cases. But in the first case it cannot be 'read', whereas in the second it can. When you can read the outline, and match it to a typically unambiguous wording, it is writing. This process seems to have been initiated successfully only three or perhaps four times in human history, and then to have spread around -- although the line between doing something yourself and copying someone else is not as clearly marked as that formulation suggests. In the course of this process, however, there evolved various different kinds

of writing system: that is, different ways in which the visual, non-linguistic semiotic came to be mapped on to the (hitherto only spoken) linguistic one.

The variable is: where do the symbols make contact with the language? The critical distinction here is the stratal one: they move in either at the level of wording, or at the level of sound. Within these strata, there may be further possibilities according to rank. If the written symbols interface with the wording (such a system is a "charactery"), there is not much choice; the symbols are more or less bound to alight on morphemes, because any element of higher rank would require too many. The number of morphemes in a language is already of the order of 10^4; the number of words will always be considerably higher.[7] If the symbols interface with the sound, on the other hand, then

[7] I put it this way for simplicity; the actual situation is obviously more complex. Elements of a higher, 'word'-like rank may be very hard to identify; they relate to each other in various ways, such as inflexion, which would need to be incorporated into the system; and they form an open-ended set, not one that is (for practical purposes) closed, like the set of morphemes. But it is a reasonable shorthand explanation, to say that a language has too many words to be able to accommodate a separate symbol for each.

they may alight on phonemes, or on syllables (such systems are "alphabets" and "syllabaries"), or on something in between the two, depending on the phonological system of the language in question.

A writing system may be relatively homogeneous, belonging clearly to one type, like Chinese (morphemic) or Italian (phonemic); or it may be much more mixed, like Japanese or English. In Japanese, two systems interact, one purely syllabic, the other in principle morphemic; while English is in principle phonemic but contains various sub-systems and is modified in the direction of the morphemic.[8] The differences among different writing systems lie not in the form of the symbols but in their function relative to the language concerned; specifically, what linguistic abstractions, identified at what level, the symbols represent.

Like sound systems (phonologies), writing systems (or "graphologies") usually contain prosodic and paralinguistic features over and above their inventories of elementary symbols. These are patterns extending over longer stretches, affecting more than minimal segments; some of them construct systems (these are the "prosodic" features), while others (the "paralinguistic") do not. In phonology, intonation and rhythm are typically prosodic features, while voice quality is typically paralinguistic; but again it is the function rather than the form that determines their significance. In writing, some of the features referred to briefly in the previous section are of this kind:

punctuation symbols function prosodically, while typeface (roman, italic, bold &c.) and graphic design (indentation, line spacing and so on) function paralinguistically -- although all paralinguistic features are available as potential resources for constructing further systems.

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[8] For an excellent brief account of the English writing system see K.H. Albrow, The English Writing System: notes towards a description, London: Longman (Schools Council Programme in Linguistics and English Teaching, Papers Series II, vol. 2), 1972; reissued London: Schools Council, 1981. Albrow's account reveals the various sub-systems that coexist in the writing system of English, thus distinguishing clearly between what are simply irregularities and what are systematic variations.

If we talk about literacy in the context of this level of the interpretation, we would mean operating with a writing system of a particular kind. Literacy in this sense has a great deal of effect on cross-linguistic movements of one kind or another: for example, patterns of borrowing between languages, and the maintenance of personal identity under the transformation of proper names. It also affects internal processes such as the creation of technical vocabulary, as well as the intersection of written text with other, non-linguistic semiotic systems.[9] For a person to be literate, in this

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[9] For example: a language written in a strongly phonemic script will not only 'rephonologize' but also 'regraphologize' borrowed words; hence Italian and Czech filosofia (not ph-). A language written morphemically will tend to calque (translate the component parts) rather than borrow; e.g. Chinese xiàngguāng 'facing light' = phototropic (but this is part of an extended linguistic syndrome in Chinese, including other features such as syllable structure). Writing English personal names in Chinese, and Chinese personal names in English, creates real problems of identity (which deserve a paper to themselves!). Constructing new technical meanings might seem to be the same in all languages, but it is also shaped by the writing system, especially where the lexical resources are drawn from outside the language as in English (Graeco-Romance) and Japanese (Chinese, English); at the same time the writing system in its turn is shaped by these semogenic processes. It would take too long to illustrate these points in detail; but consider the relationship of graphology to phonology in series such as analyse, analysis, analytic, analyticity in English; or the use of kanji, hiragana and katakana in creating new meanings in written Japanese.

sense, means to use the writing system with facility; and also to have some understanding of how it works, so as to be able to extend it when the need arises (for example in inventing brand names, or new personal names for one's unfortunate children). Some people achieve this understanding of a writing system at an unconscious level, without going through the process of knowing it consciously; but others don't, and for certain purposes one may

need to have access to it as conscious knowledge, for example as a teacher coping with children's -- or adults' -- problems in learning. To be literate is also to reflect on what writing is not: it is not pictures of things, or representations of ideas (the terms "pictograph", "ideograph", refer to the origins of symbolic forms; as functional terms they are self-contradictory). It is also to reflect on the limits of a writing system: can everything that is said also be written down? in what ways is it transformed, or deformed, in the process? -- and on how writing systems interact with other visual semiotics such as maps, plans, figures and charts (which will take us up to another level). Meanwhile to investigate questions that are raised by our exploration of writing systems, we need to look into the nature of written language.

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Written language

As a writing system evolves, people use it; and they use it in constructing new forms of social action, new contexts which are different from those of speech. These contexts in turn both engender, and are engendered by, new lexicogrammatical patterns that evolve in the language itself. If we reflect on the lexicogrammar of written English, for example, we soon recognize features that are particularly associated with language in its written mode.

A great deal has been written, since the early seventies, on spoken and written language; much of it purports to show that written language is more logical, more highly structured and more systematically organized than speech. This is the popular image of it; and it is very largely untrue -- although you can readily see how such a picture came to be constructed. If you compare taperecorded speech, with all its backtracking, rewording and periods of intermittent silence, with the highly edited, final form of a written text from which all such side-effects of the drafting have been eliminated; if you regard the overt intrusion of 'I' and 'you' into the text as making it less logical and less systematic; and if you then analyse both varieties in the terms of a logic and a grammar that were constructed out of, and for the purposes of, written language in the first place -- you will have guaranteed in advance that written language will appear more orderly and more elaborately structured than spoken. And you will also have obscured the very real and significant differences between the two.

It is true, of course, that first and second person are much less used in written texts. The system of person in the grammar construes a context which is typically dialogic, with constant exchange of roles between speaker and listener; this is not the pattern of written language, which is typically monologic and, except in a genre such as informal correspondence, does not accommodate a personalized reader as co-author of the text. (This is not to deny the role of the reader as an active participant in discourse; but the reader reconstitutes the text rather than sharing in its construction.) Hence there is less of a place for 'shifters' when making meaning in writing. And interpersonal meaning is made less salient in other ways besides; for example, there is much less variation from the unmarked choice of mood -- most writing is declarative, except for compendia of instructions where the unmarked mood is imperative. The discursive relationship between writer and readers tends to be preset for the text as a whole. But it would be wrong to conclude from the absence of 'I' and 'you', and of interrogative clauses, that the writer is not present in the lexicogrammar of the written text. The writer is present in the attitudinal features of the lexis, in words which signal 'what I approve / disapprove of'; and, most conspicuously, in the network of interpersonal systems that make up modality. Modalities are luxuriant forms of authorial judgment, aligned by the grammar along the interpersonal axis -- there is no way of interpreting not possibly in it couldn't possibly make any difference as expressing the certainty of some third party in the matter.[10] They may be presented as depersonalized, or objectified, and often are in written language (it seems, the probability is that &c.); but all are ultimately manifestations of 'what I think'.

[10] That is, assuming the clause is declarative. If it is interrogative, this merely shifts the onus of judgment on to the listener: could it possibly make a difference? = 'what's your assessment of it?'

However, a more significant feature of written language is the way its ideational meanings are organized. If we compare written with spoken English we find that written English typically shows a much denser pattern of lexicalized content. Lexical density has sometimes been measured as the ratio of content words to function words: higher in writing, lower in speech.[11] But if we put it this way, we tie it too closely to English. In a language such

[11] For example by Charles Taylor, in The English of High School Textbooks

as Russian, where the 'function' elements more typically combine with the 'content' lexeme to form a single inflected word, such a measure would not easily apply. We can however formulate the content of lexical density in a more general way, so that it can be applied to (probably) all languages. In this formulation, lexical density is the number of lexicalized elements (lexemes) in the clause. Here is a sentence taken from a newspaper article, with the lexical elements in bold:

Obviously the **government** is **frightened** of **union reaction** to its **move** to **impose proper behaviour** on **unions.**

There are nine lexemes, all in the one clause; lexical density 9. If we reword this in a rather more spoken form we might get the following:

!!! Obviously the **government** is **frightened** !! how the **unions** will **react** !! if it tries to make them **behave properly** !!!

There are now three clauses, and the number of lexemes has gone down to six; lexical density 6/3 = 2.[12]

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[12] There are of course many possible rewordings. We might for example keep the word move and end with if it moves so as to make the unions behave properly; this adds two lexemes, move and unions, but it also adds one clause, a hypotactic clause of purpose, giving a ratio of 8/4, still = 2. Other variants would alter the lexical density; but it would be difficult to find a convincing 'spoken' version in which it was not significantly lower than in the written one.

Needless to say, we will find passages of varying lexical density both in speech and in writing, with instances showing a range of values from zero to something over twenty. To say that written texts have a higher lexical density than spoken texts is like saying that men are taller than women: the pattern appears over a large population, so that given any text, the denser it is the more likely it is to be in writing. This explains the clear sense we have that a passage in one medium may be in the language of the other: someone is 'talking like a book', or 'writing in a colloquial style'.

How does the difference come about? It is not so much that, when we reword something from a written into a spoken form the number of lexemes goes down; rather, the number of clauses goes up. Looking at this from the other end we can say that spoken language tends to have more clauses. But if one lexically dense clause in writing corresponds to two or more less dense clauses in speech, the latter are not simply unrelated; they are hypotactic and / or paratactic clause complexes. Thus the spoken language tends to accommodate more clauses in its 'sentences'; in other words, to be more grammatically intricate, as I have called it. This may not emerge from

averaging over large samples, because spoken dialogue also tends to contain very short turns, and these consist mainly of one clause. But given any clause complex, the more clauses it has the more likely it is to be occurring in speech.

Most of the lexical material in any clause is found within nominal constructions: nominal groups or nominalized clauses. Thus in the example

> The separable or external soul is a magical stratagem generally employed by supernatural wizards or giants.

there are two nominal groups, and all nine lexemes fall within one or the other. But what makes this possible is the phenomenon of grammatical metaphor, whereby a semantic entity is construed in the grammar in a form other than that which is prototypical; there are many types of grammatical metaphor, but the most productive types all contribute towards such nominalization. Some process or property, which in spoken language would typically appear as a verb or an adjective, is construed instead as a noun, functioning as Head / Thing in a nominal group; and other elements then accrue to it, often also by grammatical metaphor, as Classifier or Epithet or inside an embedded clause or phrase. In the following example the two Head nouns, variations and upheaval, are both metaphorical in this way:

> These small variations of age-old formulas heralded a short but violent upheaval in Egyptian art.

How do we decide that one of the two variants is metaphorical? If they are viewed synoptically, each of the two is metaphorical from the standpoint of the other; given an agnate pair such as her acceptance was followed by applause and when she accepted, people applauded, we can say only that there is a relationship of grammatical metaphor between her acceptance and she accepted, but not -- at least in any obvious respect -- that one is metaphorical and the other not, or less so. If they are viewed dynamically, however, one form does turn out to be the unmarked one. Thus, in instances of this type, there are three distinct histories in which 'accept' is construed as a verb before it is construed as a noun:

(1) diachronically, in the history of the language;

(2) developmentally, in the history of the individual;

(3) instantially, in the history of the text.

Thus (1) the noun is usually derived from the verb, rather than the other way round (the derivation may have taken place in ancient Latin or Greek, but that does not affect the point); (2) children usually learn the verbal form significantly earlier than the nominal one; (3) in a text, the writer usually proceeds from verb to noun rather than the other way round, e.g.

She accepted the commission. Her acceptance was followed by applause. In all these histories, the process starts life as a verb and is then metaphorized into a noun.[13]

[13] For an instance of how grammatical metaphor is built up in the course of a text, see my 'On the language of physical science' in Mohsen Ghadessy (ed.), Registers of Written English, London: Pinter Publishers, 1988.

One of the reasons why these nominalizing metaphors appeared in written language may be that writing was associated from the start with non-propositional (and hence non-clausal) registers: for example tabulation of goods for trading purposes, lists of names (kings, heroes, genealogies), inventories of property and the like. But another impetus came from the development of science and mathematics, originating in ancient Greece, as far as the European tradition is concerned. To pursue these further we shall have to move one level up, to consider the contexts in which written language evolves. Meanwhile we have reached a third interpretation of literacy, namely "having a written language". Literacy, in this sense, is constructing social processes in, and through, the grammar of written language. For a person to be literate means that they are effectively using the lexicogrammatical patterns that are associated with written text. As before, this does not imply that they are consciously aware of them -- certainly not that they can analyse them grammatically! But it does imply being aware that they differ from the typical patterns of spoken language, and recognizing their functions and their value in the culture.

I am not suggesting that written language is some kind of uniform, homogeneous "style". On the contrary, it is a complex, multidimensional space of meaning-making activities, highly varied and often conflicting. But the activities are effective, and the variation is meaningful, just because certain syndromes regularly appear as characteristic of the text that is engendered -- whereas other feature combinations, which in principle could occur, are seldom or never found. These "disjunctions" are things that are not said but could be; and some of them probably will be, given the new developments in language technology.[14] The value of having

[14] For disjunctions, see J.L. Lemke, Semiotics and Education, Toronto: Victoria University (Toronto Semiotic Circle, Monographs, Working Papers and Prepublications), 1984; especially pp. 132 ff. This monograph provides the metatheoretical interpretation of social-semiotic systems (including language) as dynamic open systems which I see as underpinning a systemic-functional theory of language.

conscious knowledge of the grammar of written language is that you can use it not just to analyse but as a critical tool for asking why it is there: its place in the power structures of bureaucracy and technocracy, and in the semiotic practices of education. You can explore, and exploit, the disjunctions, and their potential for creating new meanings ("semogenic" potential) out of the resources of the lexicogrammar. This then raises the question whether the written and spoken forms are simply variants -- that is, different ways of "saying the same thing" -- or are in fact saying rather different things; which takes us to the next link in our chain.

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The written world

I referred in the last section to the way in which metaphorical patterns of nominalization are built up in the course of a text. The example referred to in note 13 was a paper entitled 'The fracturing of glass', in Scientific American (December 1987); it contains the following expressions, listed here in the order in which they occur (in different locations spaced throughout the text):

the question of how glass cracks
the stress needed to crack glass
the mechanism by which glass cracks
as a crack grows
the crack has advanced
will make slow cracks grow
speed up the rate at which cracks grow
the rate of crack growth
we can decrease the crack growth rate 1,000 times

Note how the metaphorical object crack growth rate is built up step by step beginning from the most congruent (least metaphorical) form how glass cracks.

Why? Let us focus more sharply on one particular step:

> ... we have found that both chemicals [ammonia and methanol] speed up the rate at which cracks grow in silica. ... The rate of crack growth depends not only on the chemical environment but also on the magnitude of the applied stress. (p. 81)

This shows that there are good reasons in the discourse ("textual" metafunction, in systemic terms). In carrying the argument forward it is often necessary to refer to what has already been established -- but to do so in a way which backgrounds it as the point of departure for what is

coming next. This is achieved in the grammar by thematizing it: the relevant matter becomes the Theme of the clause. Here the Theme the rate of crack growth "packages" a large part of the preceding argument so that it serves as the rhetorical foundation for what follows.

When we look into the grammar of scientific writings we find that this motif recurs all the time. The clause begins with a nominal group, typically embodying a number of instances of grammatical metaphor; this summarizes the stage that has now been reached in the argument and uses it as the taking-off point for the next step. Very often, this next step consists in relating the first nominal to a second one that is similarly packaged, in a logical-semantic relationship of identity, cause, proof and the like. Thus a typical instance of this clause pattern would be the following:

> The sequential appearance of index minerals reflected steadily increasing temperature across the area.

Here is a condensed version of the context in which this is built up:

> [Barrow] recognized a definite and consistent order of appearance or disappearance of particular metamorphic minerals (**index minerals**), across the area. ... The differences in mineralogy observed by Barrow could not be due to chemical differences because the rocks all have similar bulk chemical compositions. The most likely explanation ... is that the sequential appearance of index minerals reflected steadily increasing temperature across the area.[15]

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[15] From I.F. Clark & B.J. Cook (eds.), Geological Science: perspectives of the earth, Canberra: Australian Academy of Science, 1986, p. 239.

In a study of the evolution of the grammar of scientific English from Chaucer to the present day (reference in note 13 above), I found that this clause pattern is already operational in Newton's writing (the English text of the Opticks), becomes well established during the eighteenth century, and has become the favourite clause type by the early years of the nineteenth. Since this kind of nominalization is frequently objected to by stylists, it is valid to point out that, however much it may be ritualized and co-opted in contexts of prestige and power, it is clearly discourse-functional in origin.

However, while these nominalizing metaphors may have been motivated initially by textual considerations, their effect in the written language -- perhaps because they arose first in the language of science -- has been to

construct an alternative model of experience. Spoken language is organized around the clause, in the sense that most of the experiential content is laid down in systems (those of transitivity) having the clause as point of origin; and this -- since the clause construes reality as processes (actions, events, mental processes, relations) -- creates a world of movement and flux, or rather a world that is moving and flowing, continuous, elastic, and indeterminate. By the same token the written language is organized around the nominal group; and this -- since the nominal group construes reality as entities (objects, including institutional and abstract objects, and their quantities, qualities and types) -- creates a world of things and structures, discontinuous, rigid, and determinate. Here experience is being interpreted synoptically rather than dynamically.

This is the same complementarity as we find between the two different mediums. Spoken language is language in flux: language realized as movement and continuous flow, of our bodily organs and of sound waves travelling through air. Written language is language in fix: language realized as an object that is stable and bounded, text in material form on stone or wood or paper. The complementarity appears at both interfaces where the discursive connects with the material; and both are significant for the social-semiotic functioning of language. If we use David Olson's distinction between communicative and archival functions, spoken discourse is typically communicative, and becomes archival only under special conditions (e.g. a priesthood transmitting sacred oral texts); whereas written discourse is typically archival, a form of record-keeping, and hence can accumulate knowledge by constant accretion, a necessary condition for advancing technology and science.[16] And on the other hand, those who are constructing scientific knowledge experimentally need to hold the world still -- to stop it wriggling, so to speak -- in order to observe and to study it; and this is what the grammar of written language does for them.

Thus the written world is a world of things. Its symbols are things; its texts are things; and its grammar constructs a discourse of things, with

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[16] See David R. Olson, 'On the language and authority of textbooks', in Suzanne de Castell, Allan Luke & Carmen Luke (eds.), Language, Authority and Criticism: readings on the school textbook, London: Falmer Press, 1989, chapter 18. Note the apparent paradox that, in the archival function, written language becomes the dynamic member of the pair. The spoken archive (canon of sacred texts, traditional narrative and song, &c.) can change in the course of transmission; but it cannot grow -- it cannot become a library of knowledge.

which readers and writers construe experience. Or rather, with which they reconstrue experience, because all have been speakers and listeners first, so that the written world is their secondary socialization. This is critical for our understanding of the educational experience. Despite our conviction that we as conscious subjects have one "store of knowledge" rather than two, we also have the sense that educational knowledge is somehow different from "mere" commonsense knowledge; not surprisingly, since it is construed in a different semiotic mode. The language of the school is written language.

But, of course, educational knowledge is not constructed solely out of written language. Whereas our primary, commonsense knowledge is -- in this respect -- homoglossic, in that it is construed solely out of the clausal grammar of the spoken language, our secondary, educational knowledge is heteroglossic: it is construed out of the dialectic between the spoken and the written, the clausal and the nominal modes. Even though the scientific textbook may be overwhelmingly in nominal style, provided we are reasonably lucky our total educational experience will be multimodal, with input from teachers, parents and peers, from classroom, library, teachers' notes and handouts, all of which presents us with a mix of the spoken and the written worlds. At its worst, this is a chaos; but it does offer the potential for more effective participation in social-semiotic practices than either of the two can offer by itself.

Literacy, then, in this context, is the construction of an "objectified" world through the grammar of the written language. This means that in at least some social practices where meanings are made in writing, including educational ones, the discourse will actively participate in an ideological construction which is in principle contradictory to that derived from everyday experience. To be literate is, of course, to engage in these practices, for example as a teacher; and to construe from them a working model to live with, one that does not deny the experience of common sense. Again I would observe that, in order to turn the coin -- to resist the mystique and the seductive appeal of a world consisting entirely of metaphorical objects -- it is helpful to have a "grammatics", a way of using the grammar consciously as a tool for thinking with. It seems to me that, as David Bohm suggested with his demand for a return to the "rheomode",[17] the two worlds have been pushed about as far apart as they can go, and in the next period of our history they are bound to move together again. I think in fact they are already starting to do so, under the impact of the new forms of technology which are deconstructing the whole opposition of

speech and writing. This is the topic we have to take up next, as the next link in the interpretative chain. But in doing so, we are back where we started, concerned once again with the nature of the written medium.

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[17] See David Bohm, Wholeness and the Implicate Order, London: Routledge & Kegan Paul, 1980; especially chapter 2. Bohm is expressing his dissatisfaction with the "fragmentation" imposed by language on the world, and seeking "a new mode of language" [his italics] which would represent continuity and flux. His suggestions are linguistically naive; but the interesting point is that he is trapped in the confines of written language -- in particular the metalanguage of his own science, physics -- and does not see (or rather hear) the "rheomode" that is all around him.

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The technology of literacy

The critical step in the history of writing technology is usually taken to be the invention of printing with movable type. The significance of this from our present point of view is that it created maximum distance between written and spoken text. A written text now not only existed in material form; it could be cloned -- it had become a book. Books existed in lots of copies; they were located in libraries, from which they could be borrowed;[18]

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[18] According to The Return of Heroic Failures, by Stephen Pile (Penguin Books, 1988), the most overdue book in the history of the lending library was borrowed from Somerset County Records Office, in England, by the Bishop of Winchester in 1650, and returned to the library by the Church Commissioners 335 years later, in 1985. The book in question was, appropriately, the Book of Fines.

they could be possessed, and bought and sold, as property. Producing books was a form of labour, and created value: printing, publishing, bookbinding were ways of earning a living. The book became an institution (the book of words, book of rules), without thereby losing its material character; note they threw the book at me 'quoted the authority of the written word'. With printing, language in its written form became maximally objectified; and this extreme dichotomy between speech and writing has been a dominant feature of the five hundred years of "modern Europe", from about 1450 to 1950.

We have seen how this object-like status of the written word is enacted metaphorically by the nominalizing grammar of the written language. Meanwhile, however, the technology has turned itself around. Within one lifetime our personal printing press, the typewriter, from being manual became first electric then electronic; and from its marriage with the

computer was born the word processor. With this, in hardly any time the gap between spoken and written text has been largely eliminated. On the one hand, whereas in the printing era the written text passed out of the writer's control in being transmitted, we now once again control our own written discourse; and since we have our own private means of transmission the communicative function of writing has come to the fore, as people write to each other by electronic mail. And as the functional gap has lessened, so also the material gap has lessened, and from both ends. With a tape recorder, speech becomes an object; it is on the tape; can be "played" over and over again (so listening becomes like reading);.can be multiply copied; and can be stored (and so used for archiving functions). With a word processor, writing becomes a happening; it can be scrolled up the screen so that it unfolds in time, like speech. The tape recorder made speech more like writing; the word processor has made writing more like speech.

We have seen the effects of this in education. Teachers who favour "process writing" are emphasizing the activity of writing as well as -- and sometimes at the expense of -- the object that results from it.[19] Children

[19] This issue has been foregrounded in the "genre debate" in Australia; see for example Clare Painter & J.R. Martin (eds.), Writing to Mean: developing genres across the curriculum, Applied Linguistics Association of Australia, Occasional Paper no. 8, 1987. See also Helen Moore, 'Process vs product, or down with the opposition', in M.A.K. Halliday, John Gibbons & Howard Nicholas (eds.), Learning, Keeping and Using Language: selected papers from the Eighth World Congress of Applied Linguistics, Sydney 1987, Amsterdam: John Benjamins, 1990.

who learn to write using a word processor tend to compose their written discourse in a manner that is more like talking than like traditional writing exercises.[20] What is happening here is that the consciousness barrier is disappearing. When the material conditions of speaking and writing are most distinct, the consciousness gap is greatest: speaking is unselfconscious, proceeding as it were from the gut,.while writing is selfconscious, designed and produced in the head. (This is why the writing of a six-year-old typically regresses to resemble the spoken language of age three.) Although writing and reading will always be more readily accessible to conscious reflection than speaking and listening, relatively we now have more occasions for being self-conscious when we speak (international phone calls, talkback shows, interviews, committees and so on), and more chances of remaining unselfconscious when we write.

[20] See Jonathan Anderson,

This suggests that the spoken and the written language will probably come closer together; and there are signs that this is already beginning to happen. Not only textbook writers but also public servants, bankers, lawyers, insurers and others are notably uneasy about the "communication gap"; they are even turning to linguists to help them communicate -- note the success of the Plain English movement, towards greater reader-friendliness in written documents.[21] I have referred already to the scientists wanting a

[21] See for example Plain-English and the Law, Report and Appendices 1 - 8, published by the Law Reform Commission of Victoria (for which Robert Eagleson was Commissioner-in-charge of the Plain English Division), 1987.

discourse of continuity and flow, and suggested that the way to achieve this is to make their technical writing more like speech, so that they are not cut off from the commonsense construction of experience. But we need to think grammatically about this. To the extent that written discourse is technical, to that extent it probably has to objectify, since most technical constructs are metaphorical objects, organized in paradigms and taxonomies.[22]

[22] Martin has argued convincingly that the technicalization of discourse must depend on nominalization and gra m matical metaphor; see J.R. Martin,

On the other hand, Whorf pointed out that the technical terms of Hopi metaphysics were typically verbs. (But probably not taxonomized?)

Even non-technical writing has numerous functions for which a nominal mode seems called for. So it is not, I think, a question of neutralizing the difference between written language and spoken. What the technology is doing is creating the material conditions for interaction between the two, from which some new forms of discourse will emerge. Again the effects are likely to be felt at both the material interfaces of language: new forms of of publication, on the one hand, with (say) print and figures on paper combining with moving text and graphics on the screen; and on the other hand new ways of meaning which construe experience in more complex, and hence more "realistic", ways arising out of the complementarities of the spoken and the written modes. Such a construction of experience would seem to call once again for the poet-scientist, in the tradition of Lucretius; I think David Butt would say that Wallace Stevens is the first such figure in our own times, at least among those writing in English[23] -- but there are also scientists with the semantic prosodies of poetry, like Stephen Hawking. And if science is to technology as poetry is to prose, then the

marriage, or perhaps de facto relationship, has already been arranged: in the post-industrial, information society the real professional is the semiotician-technician, for whom the world is made of discourse/information and the same metagrammar is needed to construe both the grammar of language on the one hand and the "grammar" of the teleport, or (as we are now told -- could there ever be a more inept attempt at naming?) "multi function polis", on the other.

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[23] See for example David Butt, 'Randomness, order and the latent patterning of text', in David Birch & Michael O'Toole (eds.), Functions of Style, London: Pinter Publishers, 1988, chapter 4.

At this fifth level, then, literacy is a technological construct; it means using the current technology of writing in enacting social processes -- including the new social processes that the technology brings into being. A person who is literate is one who effectively engages in this activity (we already refer to people as "computer-literate", a concept that is now much closer to literacy in its traditional sense than it was when it was first coined). But -- the other side of the coin again -- I think that here too, and perhaps especially in this context, we need the concept of literacy as informed defence. To be literate is not only to participate in the discourse of an information society; it is also to resist it, to defend onesself -- and others -- against the anti-semantic, anti-democratic "technologizing" of that discourse. And here more than ever one needs to understand how language works, how the grammar (in its systemic sense of lexicogrammar) interacts with the technology to achieve these effects. It is rather perverse to think you can engage in discursive contest without engaging with discourse. To put this another way, you cannot resist logocentric pressures except by logocentric means.

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The frontiers of literacy

We were able to define writing, historically, as the mapping of non-linguistic visual communication practices on to language. This, as I have tried to suggest in the ensuing sections, was an important move in the history of "semogenesis", the potential for producing meaning -- comparable in many ways to the shift in the potential for material production that took place along with settlement.[24] We now need to take this one level up; and in

doing so we shall perhaps reveal the counter-tendencies that always existed and are now coming to be foregrounded once again. What is happening today is, not a loosening of the bond between the written symbol and the language (that could be achieved only by destroying the writing system altogether, and this has never happened),[25] but the creation of new systems of visual

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[24] There are striking homologies, both phylogenetic and ontogenetic, between semiotic and material "histories" (for example, it seems that infants begin to use symbols along with reaching and grasping, to use protolanguage along with crawling, and to use language along with walking). In human history, people began to write when they settled down (even here we might detect an ontogenetic parallel!); that is, when they moved from hunting and gathering to husbandry and agriculture. Whether these new practices improved the human condition is open to question (I happen to think they did); what is not open to question is that they changed it.

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[25] The nearest example I can think of is one where a writing system was replaced by another one, leading to the "de-mapping" of the first which then remained in existence as an art form -- Chinese characters as used by Vietnamese painters, for example.

semiotic that are not themselves forms of writing — that have no (in principle) unique mapping on to lexicogrammatical or phonological elements -- yet are used in conjunction with written text.

Take a mathematical expression as an example. Mathematics is not, of course, a form of visual semiotic; but it is expressed in symbols that look like, and in some cases are borrowings of, written symbols. The simplest of all such expressions would be something like 2 + 2 = 4. This is not writing; we cannot read it, because it has no exact representation in wording. We can of course verbalize it -- that is, find semantically equivalent wordings, such as two and two make four, two plus two equal(s) four, two added to two comes to four, four is the sum of two plus two and so on. But each of these has its own written form, as we have just shown; and of course they are all different -- although they are all mathematically equivalent, they are certainly not synonymous. Linguistically they mean different things, as the grammar can show.

I am not saying taht the boundary between what is and what is not writing is absolute, clearcut and determinate. (The only determinate thing about language is that it is always indeterminate.) We saw above that readers are presented with a lot of visual symbols that are on the fringes of writing: the prosodic and paralinguistic features referred to in section 2. But they are also presented, nowadays, with a great deal of visual

information that is clearly not writing, and yet has to be processed along with a written text: maps, charts, line graphs, bar graphs, system networks, diagrams and figures of all kinds. None of these can be read aloud; they have no unique implication of wording, even though again they can often be verbalized: for example, a feature on a weather map could be verbalized as a cold front is moving in a northeasterly direction across the Tasman Sea.

So although these are not made of language, they are semiotic systems whose texts can be translated into language, and that offer alternative resources for organizing and presenting information. Bernard Mohan explores this potential in an educational context in his work with ESL students in primary school.[26] It is exploited in artificial intelligence in text generation systems, which use non-linguistic representations (e.g. maps) as the source of information to be presented in text form. These can also now be incorporated into the text itself; and obviously the graphics capabilities of personal computers will encourage writers more and more to integrate non-verbal material into their writing.

In the context of a discussion of literacy, the critical feature of these non-verbal texts is that referred to above: that they can be translated into natural language. This means that they can be interpreted semantically

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[26] In Vancouver, British Columbia. See Bernard Mohan, Language and Content, Reading, Mass.: Addison-Wesley, 1986.

-- they can be construed into meaningful wordings, even though always with a fair amount of semantic "play". We tend to assume that such semiotic systems are from a linguistic viewpoint metafunctionally incomplete: that they construct ideational meanings (experiential and logical) but not interpersonal ones. (What this means is that we assume all the interpersonal choices are unmarked: declarative or imperative mood, according to the semiotic function; non-modalized; attitudinally neutral, and so on.) But if we think about these texts grammatically, we find that the situation is more complex. There are interpersonal devices, some of them very subtle; the problem is that it is here that the distance from language is probably greatest, so these meanings are the hardest to "read aloud".[27] On the other hand, the ideational meanings may be very indeterminate and ambiguous; and the textual meanings are notoriously hard to retrieve -- we are often lost to construe the Given - New structure, to recognize what we are being told and what we are supposed to know already. Yet when we verbalize these texts we have to take decisions in respect of options in all of the metafunctions. Of course these non-verbal

texts are usually presented in the context of other textual material which is in language; but this, while it may solve some problems, often creates another one -- namely, that we do no know how the verbal and the non-verbal information is supposed to be related.[28]

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[27] Since I am addicted to maps, let me use the map as an example. Obviously there is the matter of projection: on a world map, the projection defines the mapmaker's orientation towards the subject-matter (compare projection in the sense in which we use it in systemic grammar); but also towards the user, who is being treated more as an equal with conical projection, whereas Mercator is for outsiders (compare the projection of mood in report and in free indirect discourse). But there are many directly interpersonal signals: choice of colouring (there is one atlas where the colour is so strident it is difficult to read the print), size and variety of typeface, pictorial representations of various kinds -- not to mention all the modern descendants of the old-fashioned ships and sea monsters. At the least, such things indicate degrees of concern for the user; but some are more specific, for example using special symbols to indicate that the mapmaker is only guessing (probability), or that some feature is present only some of the time (like rivers in Australia -- usuality). Note in this connection O'Toole's use of systemic metafunctions in interpreting the semiotics of visual art; see L.M. O'Toole, 'A systemic-functional semiotics of art' in Peter Fries & Michael Gregory (eds.) [forthcoming].

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[28] There is a case to be made for defining "writing" in such a way that it includes these other forms of visual semiotic. If the semantic system is part of language (as I think all systemicists would agree, even if they would interpret its relationship to the lexicogrammar in different ways), then by that token visual systems which can be verbalized, and thus shown to represent language at the semantic level, could be considered to be writing systems. Against this are the following considerations: 1, they are all domain-specific and therefore partial, whereas a writing system represents the whole of language; 2, they are language-neutral, a "universal character" rather than a writing system; 3, some, at least, are not decodable out of context -- that is, you cannot construe the context from the text, as you can with written texts. So, again, if we call these writing, we shall have to call writing something else.

Somewhere in this region lie the frontiers of literacy as traditionally understood. But it would be foolish to try to define these frontiers exactly. What is relevant is that, in social processes in which writing is implicated, we typically find it associated with a variety of non-linguistic visual semiotics, which accompany it or in some cases substitute for it (like the -- often totally opaque -- signs displayed for passengers on international airports). Being literate means being able to verbalize the texts generated by these systems: "reading" the weather charts, stock exchange bulletins and share prices, street maps and timetables, pictorial instructions for kit assembly and the like. (Perhaps we should include here the filling up of forms; these are, in principle, made of language, but I suspect that in coming to

terms with them we rely heavily on their non-verbal properties!) Being literate might also include, finally, knowing what meanings have been lost, and what new meanings imposed, when there is translation between the verbal and the non-verbal; and exploring the semiotic potential that lies at their intersection -- the new meanings that can be opened up when writing impacts on other visual systems that lie outside (but not too far outside) the frontiers of language.

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The contexts of literacy

These other systems of visual semiotic, referred to in the last section, could be thought of as the contexts for a writing system. The contexts of a written language, on the other hand, are the systems and processes of the culture -- the various contexts of situation that engender written language and are engendered by it.

Writing does not simply duplicate the functions of speech. It did not originate, or develop, as a new way of doing old things. Writing has always been a way of using language to do something different from what is done by talking. This is what children expect, when they learn to read and write; as Jenny Hammond pointed out, in explaining why a class of children who had just been talking about a recent experience in very complex terms regressed to more or less infantile language when asked to write about it, it made no sense to them to go over the same task again in writing.[29] They expect what

[29] See Jennifer Hammond, 'Oral and written language in the educational context', in M.A.K. Halliday, John Gibbons & Howard Nicholas (eds.), Learning, Keeping and Using Language: selected papers from the Eighth World Congress of Applied Linguistics, Sydney 1987, Amsterdam: Benjamins, 1990.

we can call a "functional complementarity" between speech and writing.

Historically, as already implied, writing evolved with settlement; and if we think about it historically we can construct the metaphor linking writing with its contexts in other social processes. Under certain conditions, people settle down: they take to producing their food, rather than gathering it wherever it grows or hunting it wherever it roams. Instead of moving continuously through space-time, these people locate themselves in a defined space, marked out into smaller spaces with boundaries in between. (We can imagine lexicalizing this unity of people and place in terms like village, homestead, quarter.)

These people create surplus value: they produce and exchange durable objects -- goods, and property. The language that accompanies these practices is similarly transformed: it becomes durable, spatially defined, and marked with boundaries -- it settles down. This is writing. In the process it also becomes an object, capable of being owned and exchanged like other objects (written text, and books).

The meanings construed by this language-as-object are themselves typically 'objects' (inventories, bills of lading &c.) rather than processes. Meanings as things split off from meanings as events; the nominal group replaces the clause as the primary meaning-producing, or "semogenic", agent in the grammar. This is written language. The nominal group then functions to construe other phenomena into objects (nominalization), thus "objectifying" more complex forms of social organization (noun as institution) and their ideological formations (noun as abstraction).

Production processes are technologized; objects are created by transformation out of events (e.g. heating). The nominalizing power of the grammar transforms events into objects, and their participants into properties of those objects (grammatical metaphor). These transformed 'objects' become the technical concepts of mathematics and science.

All experience can now be objectified, as the written language construes the world synoptically -- in its own image (writing is language synoptically construed). Writing is itself technologized (printing). The flux of the commonsense environment, reduced to order, is experimented with and theorized. Writing and speech are maximally differentiated; written knowledge is a form of commodity (education), spoken knowledge is denied even to exist.

What I am trying to show, in this highly idealized account (of processes that are in fact messy, sporadic and evolving, not tidy, continuous and designed), is that our material practices and our linguistic practices -- not forgetting the material interfaces of the linguistic practices -- collectively and interactively constitute the human condition. They therefore also change it. In our present era, when information is replacing goods-&-serivces as the primary form of productive activity, it seems certain that the split between speech and writing will become severely dysfunctional. But it is still with us, and throughout this long period of history writing has had contexts different from those of speech. In some ways these are complementary; in other ways they are contradictory and conflicting.

Malinowski gave us the concepts of "context of situation" and "context of culture"; we can interpret the context of situation as the environment of the

text and the context of culture as the environment of the linguistic system. Martin stratifies the context into three levels, or "strata", those of register, genre and ideology; and shows that these can be networked, as systems of paradigmatic relations, like the lexicogrammar and the discourse semantics.[30] The social processes of our title can be described in

[30] See J.R. Martin, English Text: system and structure, forthcoming; especially chapter 7.

linguistic terms as contexts of language use. The principle of functional complementarity means that we can talk of the contexts of written discourse.

Certain contexts of writing are largely transparent: if we represent them in terms of field, tenor and mode then there is a fairly direct link from these to the grammar of the text. Such relatively homoglossic forms of discourse, like weather reports, sets of instructions (e.g. recipes), shopping lists and other written agendas, and some institutional discourses, can be specified so that we can construe them in either direction: given the context, we can construe the features of the text, and given the text we can construe the features of the context. To be literate implies construing in both directions, hence constructing a relationship between text and context which is systematic and not random.

Other written texts are not like this; they present a more or less discordant mix of multiple voices. These are texts whose context embodies internal contradictions and conflicts. As an example, one large class of such texts consists of those designed to persuade people to part with their money. The goods-&-services offered have to display all desirable qualities, even where these conflict with one another, as they often do; and to combine these with a price-figure that is in fact in conflict with their claimed value, and has to be presented as such but with the inconsistency explained away ('you'd never believe that we could offer ... but our lease has expired and we must dispose of all stock', &c. &c.). In the following example the text has to reconcile the 'desirable building land' with the fact that it is on a site that should never have been built on; the linguistic unease is obvious:

> ... is a high quality, bushland, residential estate which retains environmental integrity similar to a wildlife reserve.

Such features need of course to be demonstrated with full length texts.[31]

[31] For detailed treatment of a fund-raising text, approached by various linguists from different angles, see Sandra A. Thompson & William C. Mann (eds.), Discourse Description: diverse analyses of a fund-raising text, Amsterdam: John Benjamins, in press.

Another example is technocratic discourse, which, as Lemke has shown,[31] intersects the technical-sceintific with the bureaucratic -- the authority of knowledge with the authority of power -- to create a contradictory motif of 'we live in an informed society, so here is explicit evidence; but the issues are too complex for you to understand, so leave the decision-making to us' -- "proving" that children who are failing in school do not benefit from having more money spent on them, or that the environment is not under serious threat. Here however is an example of a different kind (though not unrelated to these last):

Dear tenant

IF YOU JUST WANNA HAVE FUN . . .

Come to your MOONCAKE NITE THEME PARTY next Saturday. That's September September 20 - from 7.30 p.m. until the wee hours ! !

A sneak preview of the exciting line-up of activities includes:

* Mr/Ms Tenant Contest
* Find Your Mooncake Partner
* Pass the Lantern Game
* Bottoms Up Contest
* Blow the Lantern Game
* Moonwalking Contest
* DANCING
* PLUS MORE ! MORE ! MORE !

For even greater fun, design and wear your original Mooncake creation, and bring your self-made lantern passport !

But don't despair if you can't because this party is FOR you !

Lantern passports can be bought at the door.

Just c'mon and grab this opportunity to chat up your neighbour.

Call yours truly on ext. 137 NOW ! Confirm you really wanna have fun ! ! Why -- September 20's next Saturday.

See you !

Public Relations Officer

P.S. Bring your camera to "capture" the fun !

In the cacophony of voices that constitute this text, we can recognize a number of oppositions: child and adult, work and leisure, "naughty" and "nice", professional and commercial -- constructed by the lexicogrammar in cahoots with the prosody and paralanguage. But this mixture of bureaucratic routine, comics-style graphic effects, masculine aggression, childism and condescension, straight commercialism, conspiratorialism and

hype adds up to something that we recognize: late capitalist English in the Disneyland register. Presumably there are institutions in southern California where people who are being trained to "service" business executives learn to construct this kind of discourse. The context is the disneyfication of western man (I say "man" advisedly), whereby the off-duty executive reverts semiotically to childhood while retaining the material make-up of an adult.

Literacy today includes many contexts of this contorted kind, where the functions of the written text have to be sorted out at various levels. To be literate is to operate in such complex, multiple contexts: to write with many voices, still ending up with a text, and to read such texts with kaleidoscopic eyes. Once again, the grammatics will help: it is the point about conscious knowledge again. And once again there is the other side of the coin, literacy as active defence: resisting the disneyfication, as well as more ominous pressures; probing the disjunctions, and extending the semogenic potential of the culture. This leads into the final heading.

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The ideology of literacy

There is of course no final step; but this is as far as I shall try to go. In using the term ideology here I do not mean it in the classical marxist sense where it is by definition false consciousness; nor am I implying that it is a coherent, ordered system of hidden beliefs that are taken over by the oppressed from the dominant group that is oppressing them. I use it as Martin, Hasan and others have used it -- though not as an explicitly stratal construct.[32] If we conceive ideology in this way, I

[32] See Ruqaiya Hasan, 'The ontogenesis of ideology: an interpretation of mother-child talk' and J.R. Martin: 'Grammaticalizing ecology: the politics of baby seals and kangaroos', both in Terry Threadgold et al. (eds.), Semiotics, Ideology, Language, Sydney: Sydney Association for Studies in Society and Culture (Sydney Studies in Society & Culture No. 3), 1986.

think we have to take seriously Gramsci's point that it is not so much a coherent system of beliefs as a chaos of meaning-making practices within and among which there is incoherence, disjunction and conflict -- which is why it always contains within itself the conditions for its own transformation into something else.[33] But in agreeing that ideological constructions are typically anything but consistent, I would add that there is a certain mystique at present about the opposition between order and chaos. In

foregrounding chaos -- as end-of-millennium postmodernist thinkers do, whether in physics or in semiotics -- people have tended to reify the dichotomy: that is, to treat it as a property of the phenomena under study; whereas I see it more as the standpoint of the observer. Anything we can contemplate is bound to be a mixture of order and chaos, and either can be made to figure against the grounding of the other. Rather than arguing

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[33] See Paul Thibault's Social Semiotics as Praxis (reference in note 6 above) for a detailed exposition of Gramsci's ideas. I am grateful to Paul Thibault for encouraging me to read Gramsci in the first place.

that one or other is correct -- at least in relation to semiotic practices -- I would ask what we can learn about them by interpreting them one way and then the other.

The dominant ideological aspect of literacy is obviously the authority of the written word. Consider this in relation to school textbooks. If they are to function effectively, the readers they are addressed to must believe in what they say. In a section entitled "Textbook Language, Authority and Criticism", Carmen Luke et al., and David Olson, raise the question of how textbooks derive and maintain their authority; they show that textbooks sanctify "authorized (educational) knowledge" simply by authorizing it -- what is in the textbook is thereby defined as knowledge; and they maintain this by various means such as claiming objectivity and creating distance between performer and reader, and so come to be accepted as "beyond criticism".[34] They then go on to point out that textbooks strive

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[34] See Carmen Luke, Suzanne de Castell & Allan Luke, 'Beyond criticism: the authority of the school textbook', and David R. Olson, 'On the language and authority of textbooks', both in Suzanne de Castell, Allan Luke & Carmen Luke (eds.), Language, Authority and Criticism: readings on the school textbook, London: Falmer Press, 1989.

for clarity, explicitness and an unambiguous presentation of the facts; they seek to "delimit possible interpretations". I think they do strive for these things; but I also think they often fail to achieve them. Consider these examples:

1 In many algebra books you will see numerals like "--6". This means, of course, the opposite of 6, that is, the opposite of positive 6. Thus --6 is exactly the same number as negative six or -6.

2 Your completed table should help you to see what happens to the risk of getting lung cancer as smoking increases. Lung cancer death rates are clearly associated with increased smoking.

3 In the years since 1850, more and more factories were built in northern England. The soot from the factory smokestacks gradually blackened the light-coloured stones and tree trunks.

Scientists continued to study the pepper moth during this time. They noticed the dark-coloured moth was becoming more common. By 1950, the dark moths were much more common than the light-coloured ones.

However, strong anti-pollution laws over the last twenty years have resulted in cleaner factories, cleaner countryside and an increase in the number of light-coloured pepper moths.

I have commented in detail on texts such as these elsewhere;[35] they can be obscure, ambiguous, or downright misleading to someone who does not already know what it is they are trying to say.

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[35] See my 'Some grammatical problems in scientific English', forthcoming. It should be pointed out that almost any clause in English can be shown to be in principle many ways ambiguous in its grammar; but most interpretations are too farfetched to pose real problems to a reader. I am not talking about these. The examples I am talking about are those that are problematic for the readers for whom they are intended (for example because of the kinds of grammatical metaphor they are using). It is after one has recognized them as problematic that the "grammatics" can be brought in to explain the problem -- and also to suggest how it might be avoided.

Looked at from the point of view of order, such "failures" are highly dysfunctional: the passages in question fail to give an unambiguous message. But from the point of view of chaos, they are positively functional, because not only do they admit of multiple interpretations but they can also be used to explore them -- to consider alternative readings and argue about which to accept. For example, in lung cancer death rates are clearly associated with increased smoking it is the grammar that reveals that there other ways of interpreting the statistics on smoking; it also shows what the alternatives are: does are associated with mean 'are caused by' or 'cause' (cf. means in higher productivity means more supporting services)? are lung cancer death rates 'how many people die of lung cancer' or 'how fast people with lung cancer die'? Looking at them in this light we might conclude that literacy is the ability not to retrieve a single, fixed and correct meaning from the text. Similarly, with the peppermoths, the grammar offers interesting alternatives to a Darwinian explanation!

To say that a textbook authorizes and sanctifies knowledge means that it derives its authority from its function in context. But what 'authorizes' its function is the way the text is organized. Much of the authority of the written word is vested in its generic structures, the canonical forms of text

organization that are -- more, or less, explicitly -- recognized as constitutive of the register in question.

Martin and Rothery have made it clear, since their first Writing Project Report in 1980, that they regard control of the generic forms as an essential condition of literacy. They have shown that it is possible for children to develop this control in the course of learning to write, by becoming aware of the structure of the genres they need in school and of the grammatical resources by which these structures are put in place. Their work has drawn a great deal of interest and support from teachers in Australian schools. It has also, as we all know, attracted a great deal of surprisingly virulent criticism. I say 'surprisingly' because, although all of us in linguistics are used to the highly emotional attacks made on anyone who suggests paying explicit attention to language -- it is something that some people obviously find very threatening -- the attacks on "the genre theorists" have exceeded even what we are accustomed to. One argument offered is that the structures themselves are arbitrary -- but they are not; they can (like grammatical metaphor) become ritualized for purposes of prestige and power, but they could not have attained this prestige and power if they had not been functional in the first place. The real issues are surely ideological: the Martin and Rothery position, which admits the authority of the written genres and holds that everyone needs to have access to them (and people's ease of access depends on their place in society), clashes with another ideological motif, that of individual autonomy and salvation. In this view, long prevalent in Anglo-Saxon educational thinking derived from protestant, liberal and romantic sources, any acceptance of formal structures limits the freedom and creativity of the individual (a principle applied to literacy but not, in general, to numeracy). Children should not be taught the structures -- not explicitly, at least; instead they should be ideologically armed so they may defend themselves against them.[36]

It is obviously rash to try and summarize an issue as complex as this. I am not pretending to be impartial — for one thing, I think that to go forth sword in hand to fight something when you don't know what it is (even if it is a form of discourse) is somewhat quixotic. But the principle of literacy as access to, and as defence against, has arisen throughout; I have stressed the notion of 'informed defence', but the two are not really distinct — they come together in the concept of intervention. Literacy, at all these levels, means intervening in the social processes by working with written language. And this is not something that an individual can do, as individual. Social processes are social processes. Ruqaiya Hasan has characterized the achievement of literacy in terms of three levels of attainment: (1)

(1) recognition literacy -- decoding signs as wording, and wordings as meaning; (2) reproduction literacy — reproducing the teacher's (and hence society's) models, so participating in the transmission of culture; (3) empowering literacy -- creating new structures of knowledge, and so acting to change the cultural heritage.[37] To intervene, you need the highest level of attainment. But it will be no use to you on your own.

But what we ultimately learn from a linguistic approach to literacy is that we cannot isolate 'using written language' from 'using language'. Sociologically and in other ways it may make sense to treat literacy as a thing in itself; linguistically it does not. However much written language may have its own grammar, its own discourse semantics and its own genres, everyone who writes, speaks; and the primary context of writing is speaking. All ideologies, in literate cultures, are the product of both; not the sum of the two but the dialectic between them. Our construction of experience is the dialectic between the nominal and the clausal, between reality as happening and reality as things.[38] Our mode of discourse is the dialectic between the structured genres of writing and the flow (still structured, but in a very different way) of casual conversation. At this level, it makes little sense to talk of literacy and oracy; the concept we need is that of articulacy, or making meaning.[39]

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Conclusion

I have tried to trace a course through the linguistics of literacy. It has run something like this:

1. Written medium: graphological level, material interface with the body, leading to:
2. Writing systems: relation to other levels, phonology and lexicogrammar, leading to:
3. Written language: how meaning is construed in the lexicogrammar of writing, leading to:
4. The written world: the discourse-semantics of writing as construction of experience; leading to:
5. The technology of literacy: reconstituting (1) as technicological processes, leading to:
6. The frontiers of literacy: reconstituting (2) as visual semiotic systems, leading to:
7. The contexts of literacy: reconstituting (3) as the construction of meaning by text-in-context, leading to:
8. The ideology of literacy: reconstituting (4) as the construction of society.

This suggests a kind of helical progression, as follows:

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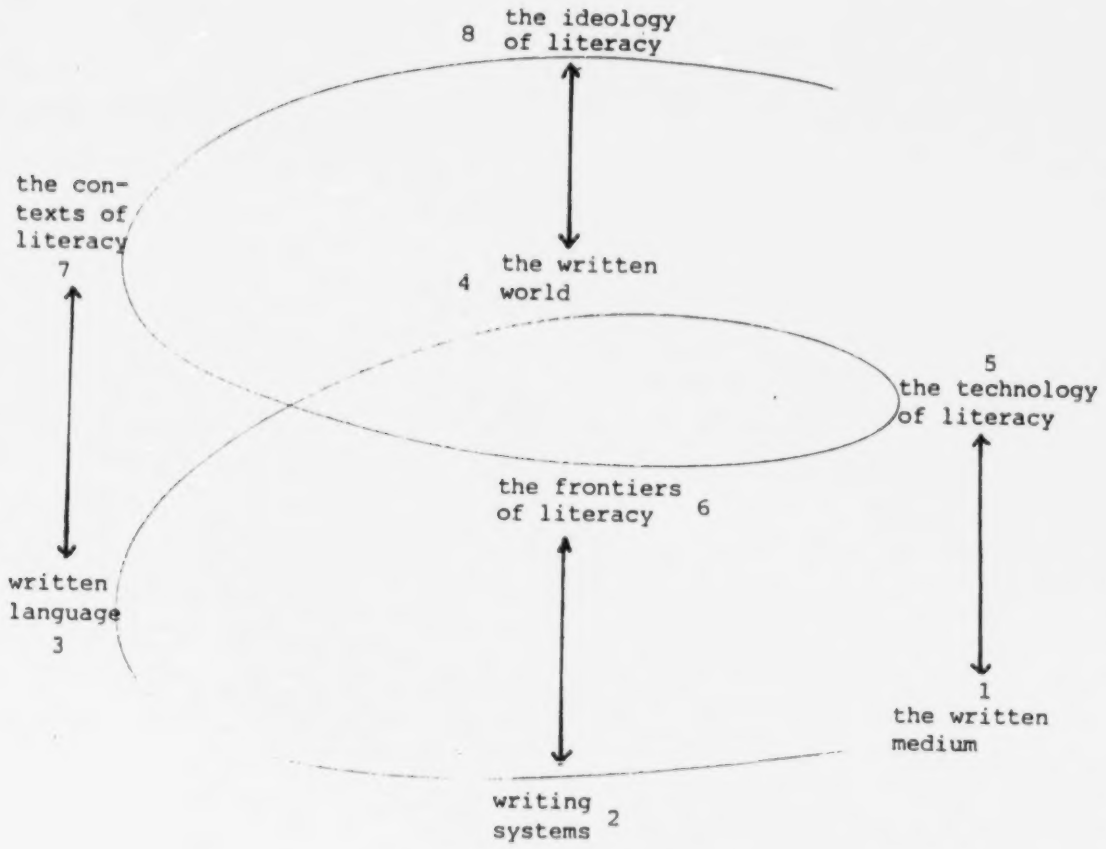

If literacy -- or articulacy -- is a way of intervening in social processes, so that semiotic practices can change social and material conditions (as the effectiveness of feminist discourse suggests they can), it follows that neither meanings nor social contexts 'pre-exist' the text. The text both construes and is construed by the context; and meaning is made by people engaging in "text-in-context" practices.

One of the silliest arguments going on is the one about whether the meaning is "in" the text. It is simply an argument about how relevant a particular theory of meaning is. The better your grammatics, the more it will enable you to reconstruct the meanings from the text -- always in the sense of "text-in-context", of course. Our systemics is a still very crude and primitive attempt to do this -- as I said in another context, borrowing the famous simile from Whorf, "the grammatics (grammar as metalanguage) is to the grammar (the language) as a bludgeon is to a rapier".[40] But a gathering like this lets me hope that we are heading in a sensible direction.

[36] See the original papers by J.R. Martin and Joan Rothery in Working Papers in Linguistics 1 and 2 (Sydney: University of Sydney Linguistics Department); the critique by Sawyer and Watson (W. Sawyer & K. Watson, 'Questions of genre', The Teaching of English 52, 1987); the reply to this critique (J.R. Martin, Frances Christie & Joan Rothery, 'Social processes in education -- a reply to Sawyer & Watson (and others), in Working Papers in Linguistics 5, Sydney: University of Sydney Linguistics Department, 1985); also Ian Reid (ed.), The Place of Genre in Learning: current debates, Geelong, Victoria: Deakin University Press, 1987; Terry Threadgold's review article taking off from this, 'The genre debate', Southern Review 21.3, November 1988, and the article 'Towards a social theory of genre' in the same volume; and the article by Helen Moore referred to in note 19 above.

[37] See Ruqaiya Hasan, 'Social structure, linguistic interaction and literacy', in Zakia Sarwar & Robert Baumgardner (eds.) [title not yet announced], Karachi: Oxford University press, forthcoming.

[38] See J.R..Martin, 'Life as a noun: arresting the universe in science and humanities', in Eija Ventola (ed.), Selected Papers from the Sixteenth International Systemic Congress, Helsinki, June 1989 [publication details not yet announced]; also my 'Language and the order of nature', in Nigel Fabb et al. (eds.), The Linguistics of Writing: arguments between language and literature, Manchester: Manchester University Press, 1987.

[39] On 'making meaning' in this sense see Gordon Bruce McKellar, 'The place of socio-semiotics in contemporary thought', and Terry Threadgold, 'Changing the subject', both in Ross Steele & Terry Threadgold (eds.), Language Topics Vol. 2, Amsterdam: John Benjamins, 1987; other works by Terry Threadgold, including 'What did Milton say Belial said and why don't the critics believe him?', in James D. Benson, Michael J. Cummings & William S. Greaves (eds.), Linguistics in a Systemic Perspective, Amsterdam: John Benjamins (Current Issues in Linguistic Theory 39), 1988; Jay Lemke, Talking Science: language, learning, and values, Norwood, N.J.: Ablex, 1990, especially chapter 8; David Butt, 'Ideational meaning and the "existential fabric" of a poem', in Robin P. Fawcett & David Young (eds.), Applications of Systemic Linguistics, London: Pinter, 1986; Ruqaiya Hasan, 'Meaning in sociolinguistic theory', in H. Kwok & K. Bolton (eds.), Sociolinguistics Today: international perspectives [publication details not yet announced]; Paul J. Thibault (reference as in note 6 above).

[40] 'Language and the order of nature' (reference in note 33 above), p. 145.

[41] See J.L. Lemke, 'Technocratic discourse and ideology', in M.A.K. Halliday, John Gibbons & Howard Nicholas (eds.), Learning, Keeping and Using Language: selected papers from the Eighth World Congress of Applied Linguistics, Sydney 1987, Amsterdam: John Benjamins, 1990. See also Paul J. Thibault, 'Grammar, technocracy, and the noun: technocratic values and cognitive linguistics', in Eija Ventola (ed.; reference as in note 38).